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ABSTRACT

The cognitive processes of planning operationalize many of the metacognitive abilities necessary for transfer of knowledge. A telephone survey of 30 adults and Delphi methodology were used to explore the vocabulary and content of the mental representations of the nature and function of planning as perceived by experts in cognitive psychology (N=9), business (n=11), everyday life planning (lay people) (N=9), and teaching (N=10). The data confirm that there is a striking convergence, within and across the sampled populations, about what planning is used and the purposes for which it is used. Four excellent and precise definitions of planning achieved a solid consensus independently: 97% agreement on all components of the definition and their 145 descriptors, 89% on the function statements, and 95% for the 159 function descriptors. The results confirm that there is a strong commonality among groups of experts about the declarative and the conditional knowledge of planning. The findings suggest that the definitional difficulties within the domain literature may be artificially amplified and are not representative of more nonacademic, real-life practitioners of planning. Results also support the contention that planning may by underutilized as an umbrella vehicle through which to funnel the instruction in many of the other metacognitive skills. (Contains 5 tables and 64 references.) (Author/SLD)

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Planning Perspectives

by Academic, Business, Lay, and Teacher Experts

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Abstract

The cognitive processes of planning operationalize many of the metacognitive abilities necessary for transfer of knowledge. A telephone survey and a Delphi Methodology were used to explore the vocabulary and content of the mental representations of the nature and function of planning as perceived by experts in cognitive psychology, business, everyday life-planning, and teaching. The data confirm that there is a striking convergence, within and across the sampled populations about what planning is used and the purposes for which it is used. Four excellent and precise definitions of planning achieved a solid consensus independently: 97% agreement on all components of the definition and their 145 descriptors, 89% on the function statements, and 95% for the 159 function descriptors. The results confirm that there is a strong commonality among groups of experts about the declarative and the conditional knowledge of planning. The findings suggest that the definitional difficulties within the domain literature may be artificially amplified and are not representative of more non-academic, real-life practitioners of planning. The results also support the contention that planning may be underutilized as an umbrella vehicle through which to funnel the instruction of many of the other metacognitive skills.

Planning Perspectives by Academic, Business, Lay, and Teacher Experts

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Introduction

Planning is fundamentally a voluntary mental activity. People engage in planning whether they are good at it or not. Planning is one of the tools we use to aid in the management, not only of our thinking but also our responsibilities and the actualization of our dreams. The quantity and quality of planning is subject to individual differences. Those who feel they have substantial control over their lives tend to plan; those who plan feel they have more control over their lives. This reciprocity is the making of the planner. Hayes (1989) reports that creative artists do more planning than non-artists. Women are apparently more likely than men to plan future activities, to spend more time in the planning stage, make more detailed plans, and to make more contingency plans (Cohen, 1989). Women support their planning with more external memory aids and mechanical planning strategies (i.e., making lists, diaries, notes etc.) than do men. Men, on the other hand, are more prone to rely on others (i.e., wives, secretaries) to produce plans or schedules (Burack & Lachman, 1992). In both genders, active anticipation of future possibilities tends to reduce uncertainty, motivate behavior, and enhance well-being (Smith, in press). Das et al. (1995) go so far as to regard individual differences in planful behavior as a personality trait. For example, individuals vary greatly in memory capacity - both to recall relevant plans from previous experience and to remember the planned sequences during execution. Individuals also respond differently to their anticipation of future events. For some, seeking information and preparing for difficulties is the most adaptive means of enhancing control, while for others, coping is best achieved by repressing or denying information and responding ad hoc. In general, preparing in advance (for financial or emotional losses) indicates better adjustment than for those who do not plan (Lachman & Burack, 1993). Similarly, there is a difference in the level of personal awareness of the planning processes. Individuals may engage in 'implicit planning', even when unaware that they are doing so. Planning is often not present at both extremes of problem situations (Scholnick & Friedman, 1987). The solution path for some problems may be so routine as to skip the planning stage altogether, allowing the individual to respond without much expenditure of either effort or attention (i.e., habitual actions such as sports activity or driving to a familiar destination). Conversely, some problem situations may seem so complex, ill-defined, or onerous as to render planning too difficult or energy intensive (i.e., solving marital problems).

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A synthesis of the current thinking about planning from an information processing paradigm may be constructed from Pea (1982), Anderson (1983), Meyer and Rebok (1985), Heppner and Krauskopf (1987) and Rebok (1989). The articulation of their findings supports the contention that planning may be seen as encompassing many of the most significant components of metacognition and problem solving. The processing can be broken into six distinct and progressive components, each essential for successful planning: 1) *Problem representation* refers to the activity of adequate psychological imaging of a problem based on problem acknowledgment, identification, and goal definition; 2) *Encoding* demands the processing and structuring of relevant information required for the identification and assimilation of problem components and their relationships. This process also includes an appraisal of the significance of the problem and its element; 3) *Pattern matching* permits relevant information to be retrieved from long-term memory, allowing encoded information to be matched with information from prior knowledge and experience; 4) *Plan construction* requires the generation and exploration of alternatives, accommodation of problem constraints, and the selection of a sequence of actions. The problem solver goes through a plan simulation and exploration of possible outcomes, which may lead to redefinition of the goal or changes in the plan. Cycles of proposal, simulation, evaluation, and revision occur as the plan is consciously constructed. Strategy selection and strategy flexibility are key factors in this dynamic activity as plans are implemented and modified; 5) *Plan execution* involves remembering the plan and the processes and is another indicator of the importance of memory in planning. Strategy deployment, planning sequence administration, commitment to goal attainment, and self-regulation are all seen as significant at this stage in the planning process. Feedback from the environment may lead to further modification during implementation; and, 6) *Plan evaluation* necessitates a follow-through of planning sequence and reflection on the completed process. Significant learning and metacognitive awareness is possible at this stage to ensure continual improvement in the conceptualization and administration of the ability to effectively plan. The role of memory is particularly integral to encoding, pattern matching, and plan execution.

The Need for Research in Planning

Covington (1987) maintains that there is an obvious, pressing need for instruction in this skill, given the pervasive evidence of planning deficits at all age levels. His research with children reveals strategic deficiencies and a lack of understanding of even the rudiments of achievement planning,

especially the ability to distinguish between quality and quantity of effort. Interviewing 8- to 12- year olds, Pea (1982) found that none of the children reported that they engaged in planning when doing school work, despite their knowledge of planning and knowledge of situations in which plans could be important. Even after years of schooling, 15 and 16 year olds reported to Lawrence and Volet (1991) that they consistently do not plan their activities, preferring to respond habitually or impulsively. In their discussion of the relationship of planning to underachievement, Borkowski and Thorpe (1994) report that high school underachievers thought less about their future careers than student academic achievers of similar ability. Given that planning requirements may vary greatly between such activities as writing an essay and organizing a chemistry experiment, students must be sensitized to the nuances of domain and contextual demands (Lawrence, 1991). Lawrence (1991) emphatically states that "if effective independent learning is part of what children are taught at school, planning is not an optional extra" (p. 91). She hypothesizes that while some experienced teachers may be cognizant of the paucity of adolescent planning, many other teachers make tacit assumptions that students indulge in more planning for their school assignments then is actually the case. The research on adults is equally disconcerting. Hayes-Roth (1980) found her subjects to be unrealistic, particularly in underestimating task completion time. When they were required to realign their inflated expectations, they placed their focus on the least important goals! She reported that these subjects sacrificed both quality and quantity as the planning task increased in difficulty. Likewise, Borkowski and Thorpe (1994) hypothesized that the use of skills required in planning and execution are deficient in adult underachievers.

The self-management of one's thinking is "reflected in the plans that learners make before tackling a task, in the adjustments they make as they work, and in the revisions they make afterwards" (Paris & Winograd, 1990, p.18). Good planners, regardless of age, engage in cycles of plan revision as they consider potentially better alternatives. Scholnick and Friedman (1993) note that "some very reflective planners not only rejoice in goal attainment but they step back to evaluate what they have learned about their goals, strategies, plans, and the environment of implementation" (p.147). The irony remains that the circumstances which require the most monitoring are precisely those complex tasks in which monitoring is most difficult. Much of the burden incurred in planning comes from resource management and allocation of attention between the competing demands of planning, acting, and monitoring. As the processes involved gain practice, less effort is required, thus allowing resources utilized for action to be available for planning and regulation (Scholnick & Friedman, 1987).

Planning is a contextually specific activity. People learn to plan in particular situations. The stimuli to plan may be invoked by internal concerns, hopes, and wishes or by externally presented problems. The need to plan is usually a response to a situation of sufficient complexity and novelty that the means to goal-attainment are not self-evident. Rogoff, Gauvain, and Gardner (1987) suggest that children may enhance their ability to adapt their planning to specific situations and to remain focused on the goal throughout their coordination of actions by practicing planning collaboratively or under the tutelage of others.

Problems in Studying Planning

The plethora of references to planning development and implementation from such a wide range of theoretical perspectives has rendered the term somewhat ambiguous. This confusion is understandable given the breadth and complexity of the cognitive and metacognitive activities necessary to anticipate and regulate behavior. Scholnick and Friedman (1987) propose five reasons for the definitional confusion: 1) The numerous definitions of planning may be a result of a failure to specify a particular focus on one of three simultaneous levels of operation, the problem space, the mental representation, and the relationship between the two; 2) Arrival at coherent definition may have resulted from confusion from the two distinct points of view of planning; that of a general cognitive ability and that of a context-specific activity; 3) Separation of motivation from planning leads some theories to consider planning to be compulsory to certain problem solving activities at the exclusion of the reasons one decides to plan in the first place. Other theories may concentrate on the motivational aspects, at the expense of the planning processes themselves; 4) Research methods vary in the exploration of quantitative and qualitative individual differences in planning performance. Some theories measure activity in terms of number of components present, speed of processing or execution, while other theories explain these differences in terms of personal style, beliefs, etc.; and finally, 5) The complexity of the goal-oriented activities involved in planning may lead to quite different emphases by theorists. Highlighting one process (i.e., representation, goal identification, strategy repertoire, choice, and repair, plan evaluation etc.) may influence a given model of planning and result in confusion.

What is Planning? : Definitional Difficulties

> "In psychology, as in any number of other fields, the fuzzier the concept, the more readily it seems to be used. The fact that these terms are employed so frequently is a good indication that they indeed fill a need, a need which would be better served if the term were more clearly delineated,

broken down, and its connections with related concepts made more explicit"
Hoc, 1988 (p.ix)

Influences on the processes of planning are fraught with variation, whether social, psychological, intellectual, experiential, developmental, cultural, etc. The term planning has frequently been used in describing many activities; e.g., problem solving, business management, cognitive processes, psychology, architecture, economics, artificial intelligence, language production, and memory. These diverse theoretical perspectives have failed to adequately address themselves to the task of defining exactly what planning is. Perhaps this deficiency is a result of the fact that planning does cut across so many traditional frontiers of inquiry. The literature on planning appears controversial about many aspects of planning behavior, partly due to these definitional difficulties. The choice of definition guides which questions will be asked and which answers will be offered.

There is a smorgasbord of definitions proposed in the literature on planning. Miller, Galanter, and Pribram's (1960) definition of planning as 'a hierarchical process controlling the performance order of a sequence of operations' has proven to be too limiting. The use of the terms 'hierarchical' and 'sequencing' as criteria, exclude abstract plans which are not so structured. On the other hand, Hayes-Roth and Hayes-Roth's (1979) definition, "the predetermination of a course of action aimed at achieving some goal" (p.276) turns out to be too broad, as it includes any strategy or sequencing activity. More comprehensively, Pea (1982, p.6) defines planning as "a complex form of symbolic action that consists of consciously preconceiving a sequence of actions that will be sufficient for achieving a goal". Pea emphasizes the anticipatory, representative nature of planning, which includes some degree of conscious awareness. Kreitler and Kreitler (1987, p.207) suggest that "planning is a complex cognitive activity that occurs when no program able to regulate action is available". This interpretation assumes that "every act of behavior is regulated by programs, i.e., hierarchical systems of instructions on different levels of inclusion". In a broader light, Rogoff et al (1987) define planning as "deliberate organization of actions oriented toward a goal" (p.303). Their definition of planning stresses its relationship to context, indicating that the degree of elaboration and specificity of a plan vary according to the circumstances in which planning occurs, the context in which actions occurs, the actual action themselves, and the skill of the planner. Scholnick and Freidman (1993) emphasize the use of knowledge in their definition. The list goes on.

Rather than edify, the variety of definitions has made the term even more ambiguous (Scholnick & Friedman, 1987). Specifically, planning has been confused with problem solving itself. Some view

problem solving and planning as interchangeable skills (i.e., Medland, 1990), or planning as one problem solving heuristic (Newell & Simon, 1972; Oppeheimer, 1987), while others view planning as a goal-oriented behavior, highly influenced by context (Hayes and Nash, unpublished manuscript), which develops at different times and levels (Friedman, Scholnick, & Cocking, 1987).

Kreitler and Kreitler (1987) postulate that despite many commonalties, that planning differs from problem solving in three ways. Firstly, they conceive of planning as a cognitive construction and problem solving as a cognitive execution. Secondly, while planning is future oriented, problem solving may deal with issues unrelated to either action or the future. Thirdly, they define planning as fundamentally procedural, while problem solving may deal with non-procedural issues such as causation, results, purposes, etc. Their research has confirmed that children gradually distinguish planning from problem solving, and also from fanciful daydreaming. The children also note that planning may include both problem solving and daydreaming.

Friedman, Scholnick, & Cocking (1987) remind us that the notion of problem solving conjures difficult or urgent situations which require immediate remediation to attain normative or optimal levels. Planning, in their view, conjures a more leisurely attitude toward hopes and dreams of possible realities. Conceding the overlap between problem solving and planning, there is a growing consensus that these processes are not isometric. Planning can occur even when there is no problem to be solved. Notwithstanding these nuances, all elements of the literature concur that planning is a challenging activity requiring the integration of all the component parts and is therefore the avenue through which human beings integrate problem solving.

Similarly, there is a confusion about the distinction between planning and action which influence definitions of planning. Some theorists firmly discriminate between the two (Hoc, 1988; Holyoak, 1990; Kreitler and Kreitler, 1987), while others adamantly maintain them to be indivisible (Meyer & Rebok, 1985; Rebok, 1989). These controversies are compounded by the plethora of definitions emerging from the literature (Miller et al., 1960; Hayes-Roth & Hayes-Roth, 1979; Pea, 1982; Rogoff et al., 1987; Scholnick & Friedman, 1993). Each of these distinctions is an exemplar of the varying placements of planning on a continuum from conceptual activity to action. However, exploration of theoretical distinctiveness between planning and problem solving and planning and action tend to further confound rather than inform us about what planning really is.

Research Problem

In the present study, it is hypothesized that the process of planning is one in which individuals engage throughout the life-span in a more conscious sense than many of the other metacognitive processes, such as monitoring, self-correcting, assessment of what one does not know, etc. Metacognitive awareness of the appropriateness of planning and the need to plan may be learned from instruction in critical thinking skills (Scholnick & Friedman, 1987). An understanding of the underlying managerial thinking processes involved in planning may enhance learners' metacognitive awareness. Because effective planning operationalizes executive control processes, planning may be a viable connector between educational settings and real-world application for transfer. Since planning is a skill widely used in real-life contexts, there may already be an available vocabulary enjoying common usage and definition. Should this be the case, it is important to understand how planning is mentally represented by members of society who hold responsibility for the knowledge, execution, and / or instruction in this ability. A demonstrated general consensus of what comprises this cognitive process may establish its efficacy as a vehicle through which to focus discussion of higher-order thinking processes between educators and learners of all ages and abilities. The aim of the research is to make as explicit as possible the mental representation of four domain-related groups about **the nature and function of planning**.

Limitations in the Literature Concerning Planning

An overwhelming majority of the references to planning in the literature are in relation to the nature of planning. The abundance and repertoire of definitions have increased the difficulty in studying planning perspectives. Friedman, Scholnick, and Cocking (1987) speak directly to "a controversy about the prevalence of planning in human behavior" as a result of different definitions of planning (p.517). There is a clear need to go beyond the territoriality of research paradigms to understand how planning is defined by the practitioners who daily rely on this ability. The limited research to date has focused almost exclusively on children to define what is meant by the term planning.

A distillation of the vast corpus of literature from cognitive and developmental frameworks reveals that two dimensions are preeminent, an internal dimension and an external dimension. A summary of the important elements found in the literature and relevant sources are presented below. Six components emerge as descriptors of the internal dimensions of planning: 1) The *nature of planning* focusing on definitional aspects, planning as a problem solving activity, anticipatory, opportunistic, and

transactional planning, and degrees of abstraction is presented in the works of Brateman (1987), Hayes and Nash (unpublished manuscript), Goodnow (1987), Brown (1987), Hayes-Roth and Hayes-Roth (1979), Rebok (1987), De Lisi (1987), and Scholnick and Friedman (1987); 2) The *nature of the problem* emphasizes the problem representation (i.e., type of problem, degrees of difficulty, of novelty, and of complexity) and contextual variables, as articulated by Newell and Simon (1972), Heppner and Krauskopf (1987), Pea (1982), and Miller et al. (1960); 3) *Planning processes* dealing with goal definition, encoding, generation of alternatives, strategy selection and flexibility, pattern matching, plan simulation, plan construction and execution are explored by Nickerson, Perkins, and Smith (1985), Wilensky (1981), Hoc (1988), Hayes and Nash (unpublished manuscript), Heppner and Krauskopf (1987), Kluwe & Friedrichsen (1985), Miller et al. (1960), Hayes-Roth and Hayes- Roth (1979) Borkowski, Carr, and Pressley (1987), and Pressley, Borkowski, and O'Sullivan (1985); 4) The *nature of planning beliefs* about this life skill, beliefs about control, and about degrees of planning have been studied by Blank, Levesque, and Winter (1993), Smith (in press), Pea and Hawkins (1987), Lachman and Burack (1993), Scholnick and Friedman (1993), Goodnow (1987), Miller et al. (1960), Hayes (1989), and Brown (1987); 5) The *nature of the planner* as distinguished by beliefs about individual differences, affective orientation (perception of self as a planner, perception of others as planners, resistance to planning), motivation and intentionality, and prior experience is extensively written about by Smith and Baltes (1990), Smith, Dixon, and Baltes (1989), Smith (in press), Kreitler and Kreitler (1987), Oppenheimer (1987), Goodnow (1987), Miller et al. (1960), Heppner and Krauskopf (1987), and Borkowski, Johnson, and Reid (1987), and lastly; 6) *Regulation,* including meta-planning, plan abstraction, representation, plan process remembering, feedback considerations, revision, and plan evaluation, is elaborated in the contributions by Brown (1987), Pea (1982), Randall (1987), Rebok (1987), Meyer and Rebok (1987), Newell and Simon (1972), Cocking and Copple (1987), Hayes and Nash (unpublished manuscript), Bratemen (1987), and Hayes-Roth and Hayes-Roth (1979).

The second dimension, the external dimensions of planning, is described in the literature dealing with contextual and social variables, addressing the functions of planning: 1) *Contextual variables* include such elements as constraints, environmental factors, resources, temporal considerations (for planning and for plan duration), consequences of planning and of not planning, domain-related factors, and personal (informal) versus professional (formal) planning and are studied in the works of Rebok (1987), Friedman and Scholnick (1987), Randall (1987), Hoc (1988), Cocking and Copple (1987), and Goodnow (1986); and, 2) *Social variables* may be at an interpersonal or societal level and may involve collaboration,

coordination with other plans, and communication as indicated by the findings of Goodnow (1987), Miller et al. (1960), Oppenheimer (1987), and Rogoff, Gauvain, and Gardner (1987).

In relation to the functions for which planning is used, the literature is unusually reserved. Despite the assumptions made in choosing research planning tasks and instructional examples, the few references made to what planning is used for are mostly in the context that it would be advisable to know more about this. The notable exceptions are Pea (1982) and Kreitler and Kreitler (1987) in their studies on children's impressions about what planning is used for. In his discussion of the confusion surrounding the terminology of such concepts as planning, Hoc (1988) contends that these terms could have greater utility if they were more clearly defined, i.e., broken down precisely and made more explicit. It is important in the instruction of planning that the terms used are meaningful and representative of those used in extra-curricular contexts to facilitate transfer. Numerous authors (i.e., Covington, 1987; Sternberg, 1985; Pea, 1987) call for a greater relevance of the problems in school to the problem solving processes in real life contexts. The literature clearly situates planning as a contextually specific activity (i.e., Rogoff et al., 1987; Cocking & Copple, 1987). Brown et al. (1983) emphasizes that children may not understand what kinds of situations planning is used for. This type of knowledge is normally gained informally from experience. A greater understanding of the functions of planning may give structure and opportunity for learning this conditional knowledge in curricular settings. A greater awareness of social norms for planning situations in various contexts, may predispose students to more readily apply their knowledge of planning in their lives (Goodnow, 1987). As planning is the use of knowledge for a purpose (Scholnick & Friedman, 1993), it is important that students become more aware of context and domain specific demands (Lawrence, 1991). This contextual or conditional knowledge is an important connector between declarative and procedural knowledge and is essential for planning success and maturity (De Lisi, 1987; Lachman & Burack, 1993; Kreitler & Kreitler, 1987). Knowing when and where to plan is essential to transfer (Brown et al., 1983). A greater understanding of the conditional knowledge of planning will have utility for enhancing transfer of learning, for structuring tasks for research, and for examples for curriculum development. Pea (1982) encouraged researchers to explore specific interrelationships among the purposes planning is used for, as well as conditions to enhance or limit the development of planning activities.

Methodology

The mixed methodology selected are of telephone survey, the Delphi Method (Linstone & Turoff, 1975), and content analysis. An initial data collection was conducted by means of a telephone survey. The content analysis was then fed back to each of four selected samples through the Delphi Methodology. Each cell results were independently analyzed, modified, and returned to the respective cell from which they were derived, in a process of reiteration three times (Round 1, Round 2, Round 3) before closure and final analysis of results. Within cell analysis, without cross-fertilization, allowed each domain-specific stream to run its full course. An across-cell content analysis, following closure of the data collection phase ascertained the level of convergence, i.e., the degree of similarity or dissimilarity between cells.

Certain assumptions were made by the researcher in the reception of these data and their analysis; i.e., that the respondents were as honest as possible, that adequate time was given to each participant to render their responses meaningful and representative of their true knowledge, beliefs, and experience, and finally, that not all of these components would necessarily be expressed in full. The methodology was conceived to give respondents opportunity to express their views as they pertain to the emerging categories.

Telephone Survey Methodology

The initial procedure consisted of a survey of the general population. Names were randomly selected from the city telephone book of a major Canadian city. The telephone survey (N=30: 13 males, 17 females) was requisite to provide baseline data for the substance of the first Delphi round. Three survey questions were posed: 1. *What is planning?*; 2. *How do you do it?* ; and 3. *When and where is it used ?*. Using the findings and vocabulary of the literature on planning in cognitive science and developmental psychology, the resultant comments from the participants in the telephone survey were grouped for content. It was decided to include only such items as were mentioned by at least one third of the individuals (e.g. Kreitler & Kreitler, 1987). A total of 15 statements from the general public, accompanied by an example, in part constituted the questionnaire sent to the respondents in the first Delphi round.

The Delphi Method

As is customary in the Delphi Method, all participants for the study were purposively selected, volunteering to be a part of their designated group. The groups of experts sampled (total N= 39) represented areas of specialty in planning; Academic cell (N=9), Business cell (N=11), Lay cell (N=9), and Teacher cell (N=10). The term 'expert' as it is commonly used in the context of the Delphi Method has various connotations. Some latitude may be taken in defining the concept of expertise to suggest the pre-eminence of experience, and to accommodate varying and appropriate criteria for the different domains. Moore (1987, p.51) defines an expert to be an individual "who possesses the knowledge or experience necessary to participate in a Delphi. A nuclear physicist is an appropriate expert if the Delphi concerns atomic energy and a resident of a neighborhood is an expert on what should be a community's goals." A combination of knowledge and experience constitute the criteria for inclusion in the research presented. The specific combination varies for each group, depending on the type of expertise in planning.

The Academic cell was comprised of international experts (4 females, 5 males) in planning and problem solving. Their research has addressed planning in the areas of cognitive development, memory, composition, reading, motivation, practical intelligence, critical thinking, strategy acquisition, strategy deployment, everyday applications, and gerontological development in various domains of endeavor. Business expertise is considered to represent the type of expert knowledge required for financial and administrative planning for success in the work place. The composition of the Business cell (8 males, 3 females) were members of the local business community in major urban centers, with one exception. Each was assumed by position and level of responsibility to possess expertise in planning in their related fields; each was a president, owner, general manager, or director of his or her respective organization.
The Lay cell was composed of a sub-group of the participants in the telephone survey. Lay expertise represents the significant experiential knowledge base gained through everyday or personal problem solving. Smith, Dixon, & Baltes (1989) suggests that this expert knowledge in life-pragmatics is generalizable across multiple specific domains. These authors maintain that the concepts and criteria for expertise in formal domains are also applicable to comparatively ill-structured and informal knowledge domains including parenting or everyday living. The Teacher cell (5 female, 4 male) represented all levels of education; elementary, high school, and university. This final domain of expertise is considered by virtue of position and societal expectation, to be the earliest transmitters to model and instruct planning in a formal setting.

Data Collection and Preparation

The results of the responses to the 15 survey statements on a Likert scales of 1-5 (5 being full agreement) were tabulated, converting each score to a percentage for comparison purposes, to compensate for an inconsistent number of participants across cells. The scores in Table 1 clearly confirm that the elements mentioned by at least one-third of the general public were considered important by all

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Insert Table 1 about here

Delphi cells. Out of a possible 60 entries for the scores for Round 1, only 6 were below 80%, a strong affirmation of support. The high scores confirm the validity of the statements.

The same three research questions were posed to the Delphi participants as had been asked in the telephone survey. The comments (some hand written, others typed) were compared for content. Responses were initially grouped into the two dimensions of planning investigated by the present study, those of *nature* and *function*. Several large categories reflecting the nature of planning (Goal, Plan, Mental Representation, Decision-Making, Regulation, Social, Organization) were identified from Round 1 responses. There was a certain degree of variation across cells: for example, not every cell had a large category of "Social". A second portion on the nature of planning consisted of the definitions of large categories. Statements relating to function, were similarly grouped into large categories, varying in number from eight to nine, depending on the cell in question.

Results and Interpretation on the Nature of Planning

The cell definitions, displayed in Table 2, emerged from Round 3 of the Delphi approach. These

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Insert Table 2 about here

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were partitioned according to eight global orientations,called dimensions. These orientations can be represented by rays of an octagon. The presence of an orientation is identified by a ray of the octagon, while an absence of an orientation is represented by the center of the octagon, similar to the spokes on a wheel. These spokes produce a graphical representation, a 'signature' of the definitions, as displayed in Figure 1. Each signature denotes the main focus of the cell definition. A perusal of Figure 1 indicates

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Insert Figure 1 about here

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that the Academic and Lay cells are the most focused, with four dimensions each, the Business cell shows six dimensions, and the Teacher cell is the most explicited with seven. The cell signatures schematically highlight the eight dimensions, those of: Representation (R), Decision Making (DM), Strategy (STR), Organization (O), Management (M), Regulation (I), Individual (IND), and Social (S). The dimension of Representation refers to the processes involving consciousness, intuition, logic etc. included in the cell definition; Decision Making describes acts of choosing, prioritizing, analyzing; Strategy includes references, tactics, or procedures; Organization reflects mention of such as sequencing, procedures etc.; Management indicates the conducting or supervision of something; Regulation contains reference to revisionary processes, evaluation, iteration, monitoring; Individual encompasses that relating to the personal or subjective orientation; and Social describes that relating to others. The analysis of these representations is confined to the actual definitions produced by each cell, not including auxiliary comments by respondents. With these constraints, no one cell demonstrates all of the eight dimensions. Organization (O), Regulation (I), Social (S) where it appears, achieved full agreement within each cell with no additions or caveats.

The dimension of Strategy (STR) was observed within all cell definitions with the exception of the Lay cell. The strategic nature of planning was rated a third priority in statement results in the first round, survey statement results, but is not found in the Lay cell definition. All cells included the dimension of Organization (O). It is interesting to note that although achieving consensus in all Delphi cells, 'organization' received the lowest priority in the statements from the telephone survey. Regulation (R) and Organization (O) were the only dimensions of the definitions which were consistent across cells. The Teacher cell was the only one to explicit an Individual dimension. The Social dimension was identified in all cells but the Academic. Although not explicitly mentioned in this cell, the concept is approximated in the statement that planning involves person and relationship management. This cannot, however, be included in the social dimension as it does not indicate that there is a social nature of planning. The social aspect is dealt with in the components of the definition and descriptors and in Academic respondent comments, but not in the definition itself. The social dimension is clearly seen by the Academic cell as a function rather than a part of the nature of planning.

Each cell reached full agreement on the definition of the seven component terms of Goal, Mental Representation, Decision Making, Organization, Regulation, Social, and Plan, as displayed in Table 3, where F indicates full agreement or consensus. It is significant to note that with minor cell variations.

Insert Table 3 about here

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these cell definitions of planning components are completely compatible with those found in the literature, albeit eclectically. This provides a cohesive vocabulary for analysis and discussion of the four domain conceptions of planning.

Results and Interpretation of the Function of Planning

Kreitler and Kreitler (1987) specify the research challenge that "the specificity of planning does not consist mainly or exclusively in the kind of involved processes, but in their organization, in the way they function together, and in the uses to which it is put. Whereas the manner of functioning is mainly a characteristic of planning, the uses are rather dependent on the planner" (p.265). In support of this, Scholnick and Friedman (1993) suggest that a comprehensive account of planning must attempt to explain not only how people plan but also when people would use such a skill for a given purpose. The strong consensus for the vast majority of the ten function statements indicates a domain consensus of the uses of planning, as displayed in Table 4. The variations in agreement for the function descriptors

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Insert Table 4 about here

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support the notion that the functions to which planning is put may have considerable idiosyncratic variation.

The results on function clearly situate planning as an important life skill, facilitating goal-attainment, problem solving, organization of resources, preparation for the future, social coordination, control over self and environment, and life-enhancement. Irrespective of slight variations, the data unequivocally also confirms the commonality of conditional knowledge among experts from different domains about the function of planning. The responses were rich and informative concerning what planning is used for and the degree of appropriateness of planning in different contexts.

Discussion

Defining the term 'planning' from various domain perspectives:

The data collection and analysis consisted of three stages, within each of the four independent groups. When compared, the final analysis showed a strong convergence across cells. As the fundamental

purpose of the Delphi Methodology is to attain stability or consensus of response, it is not surprising that the data collection has achieved high levels of agreement from all cells. What is significant is the extent of this agreement. The modified Delphi Method employed is considered to have been effective in the exploration of such a complex cognitive process as planning. The flexibility of the iterative methodology may be assessed by the ease with which the format was self-modifying to suit the views of the cell members. Their satisfaction is unquestioned, for both nature and function of planning, considering that all definitions reached solid consensus and an impressive 97% agreement on all components of the definition and their descriptors, 89% on the function statements, and 95% for the function descriptors.

The high quality of the cell definitions overwhelmingly supports the underlying postulate that there is a remarkably common mental representation about planning, between specialists in the field, sampled members of the general public, educational practitioners, and entrepreneurs. This highly elaborated declarative knowledge base produced four cell definitions of quality and substance. When compared with the definitions of planning in the literature, it is the opinion of the authors that each cell has produced a definition of superior quality and elaboration. The participants are cognizant of what planning means and were able to articulate their metacognitive knowledge in the data gathering phase. Table 5 displays a composite definition, extrapolated from the essence of the four cell definitions by

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Insert Table 5 about here

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the authors. Other composites might be constructed and prove equally valuable, provided that all dimensions of the signatures of the definitions (representation, organization, decision making, management, strategy, regulation, individual, and social) are included. The combined knowledge and expertise about planning has yielded an excellent and comprehensive definition of planning. The extensive definitional controversies plaguing the literature on planning may be somewhat artificially generated and might benefit from this type of research.

The signatures of the definitions highlight the areas of focus of each definition. The most pronounced areas of commonality with regard to the definitions of planning are three: firstly, that planning is goal directed; secondly, that organization is almost synonymous with planning; and thirdly that regulation is cardinal to planning. The goal-directed nature of planning is reflected in each cell definition and also in FS1 (Planning is used to enhance problem solving or goal-directed activity). Both organization and regulation achieved consensus for definitions of the components and all descriptors. Not only is the nature of planning organizational but an important function also, as expressed in FS2 (Planning is used to

organize [human and] material resources). Pervasive throughout the results is an emphasis on the paramount importance of plan flexibility and revision, both components of the metacognitive ability to regulate one's planning activities. This provisional aspect of planning supports the literature (e.g., Meyers & Rebok, 1985; Brown, 1987) in the significance of regulation in mental representation and in effective planning.

It is to be expected that the Academic cell manifested an exceptional declarative and conditional knowledge of planning processes and its uses. What is unexpected is that nine experts from various countries and theoretical orientations were so easily able to achieve nearly 100% agreement on all aspects of the data collection (definition, component terms and descriptors, 7/8 function statements and all descriptors). In fact, their levels of agreement were the most outstanding of any cell. The review of the literature reveals a multitude of definitions used in research, as well as variance on position about the distinction between planning and action, and planning and problem solving. Such differences were not evidenced in the research findings, perhaps indicating the divisions may not be as severe as the literature indicates. There may, indeed, be a new convergence about what planning is and how it is used among experts which is not reflected in latest writings. By defining the terms used so precisely, it was possible to quickly generate an elegant and comprehensive definition of planning from this cell.

One of the most distinguishing findings from the Academic cell was the lack of a 'social' category for the nature of planning. As much of the academic life is more self-determinate (i.e., in area of expertise, instructional content, research foci, etc.) than many other occupations, these participants may, perhaps more than any other cell, perceive planning to be primarily an individualistic process, occasionally requiring collaboration. This is supported by the survey statement, *planning involves interacting with other people*, receiving the lowest of the scores from the academic group (51%). One respondent captured this difference in her comment "In most cases, I plan by myself, but there are also instances [both everyday and life planning] where planning takes place in a social context and the end is a joint product". Her examples of collaborative planning are not domain-related but rather personal.

Defining the component terms of planning from various domain perspectives:

There was also a demonstrated common vocabulary of the terms used to describe planning and its processes, established by the high levels of agreement on the definitions of component terms for all groups. The terminology employed by the participants is specifically that adopted in the literature on metacognition, i.e., monitor, revision, evaluation, management, iteration etc. Similarly, the seven

component terms used to describe the nature of planning (goals, mental representation, decision making, organization, regulation, social, and plan) were clearly defined and used in a similar, often identical, manner by the respondents of each cell. These rather simple terms may be used with learners of all ages and be easily transferred to everyday and work-related contexts throughout the life span. The data gathered manifests a similarity of terminology available for instructional purposes. The current ambiguity of terms used in the literature is at variance with the findings of the present research. The results emphasize collective consensus within the sampled populations.

Identifying the perceptions of the function of planning from domain-related perspectives:

People's conceptions about planning define the sphere of planning and establish what is relevant or irrelevant to planning for themselves (Kreitler & Kreitler, 1987). All cells were able to articulate an impressive level of conditional knowledge about the functions of planning, achieving high levels of agreement within cells. These individuals were aware of the purposes for which planning is used, as illustrated in the numerous descriptors of the function statements. Planning is used: to enhance problem solving or goal-directed activity; to organize human and material resources, to structure/ think about/ prepare for the future; to coordinate activities with people; to increase control (over self and situations) and deal with uncertainty; to respond to most everyday situations; to enhance one's life; and for evaluation. The particular contexts and fashions in which these functions of planning are manifest are nuanced in the 159 descriptors generated, of which 95% obtained consensus. These results supplement a paucity in the literature about the function of planning.

The Lay cell was singular in achieving full agreement on all 8 function statements as well as the definition, all components of the definition, with the exception of the notion of the unconscious, and all descriptors of the components. This represented the second highest level of agreement for the entire study, after the Academic cell. It is interesting to note that the Lay cell rated the survey statement, *planning is a thinking activity*, the highest of all cells (96%) but the statement, *learning is a part of effective planning*, was rated the lowest (80%), as displayed in Table 1. Perhaps planning is seen, by the Lay cell, as a taxing mental activity and rarely perceived as a proactive instrument for knowledge acquisition.

The findings confirm that planning is seen as an extremely useful tool in a multitude of instances. Knowing where and when to apply planning knowledge is a vital component of metacognitive functioning. The results on respondents' conceptions of the functions of planning may be used to

construct planning tasks perceived by learners to warrant planning. The ten function statements clearly define what experts in these four domains consider ecologically valid uses of planning and are well elaborated through the 159 descriptors. These results may also form a bridge between research findings and instruction in the conditional knowledge necessary to provide transfer to real-world situations.

Comparing the perceptions of the nature and function of planning between various domain-related experts:

The incorporation of data from both the survey population and its sub-group, the Lay cell, provides triangulation with findings from the more easily characterized elite participants from three other domains. The combined tacit knowledge and aggregate experience in life-planning endeavors contributed from the Lay cell, stands boldly with the other domain-related results, even those from experts in cognitive science. The inclusion of the conceptions of planning from these representatives of the general public is an exemplar of the pervasive similarity across sampled groups.

The Academic cell perception of planning as primarily a non-social endeavor is at variance with the perceptions of the other three cells, which definitely conceived of planning as a more social process. This difference is evidenced at all levels of the data collection regarding the nature of planning. The social nature and function of planning was clearly articulated in the results. Perhaps the omission of a social category from the Academic definition and therefore from the rest of the section on nature was an indicator that this cell perceived planning as socialized ("planning is an aspect of cognition which is socialized ... throughout the life span") but not social in essence. The other cells clearly view planning as social in nature, although not always. The social function of planning is given full agreement across all cells in FS4 (Planning is used to coordinate activities with other people). The support in both areas of the data collection gives credence to the assertions of such authors as Vygotsky 1978), Rogoff et al. (1987), Goodnow (1987), and Smith (in press), that planning is social in its development and practice. There was concern expressed not only for the interpersonal aspects of planning, but also about how planning is conducted on a societal level.

One distinct and rather unsettling finding from the data analysis is the perspective about planning from the Teacher cell, in regard to teaching and learning. Teachers perceived the research queries to be related to their own cognitive processes and planning behavior. The personal value of planning is seen particularly in the teachers' well elaborated response to the FS9 (Planning is used to enhance one's life). It is a significant omission that the Teacher cell failed to directly link this exploration to their professional

role as models and instructors. They neglected to mention their role in guiding the plans of those in their care or collaboration about planning with students. In fact, no teacher mentioned students at all, in comment or contribution. There was also no mention of the idiosyncratic nature of planning, which would be expected from their classroom experience. At the most fundamental level, planning may be a skill teachers envisage themselves practicing well and often, but do not perceive this skill in a constant modeling and supporting role with their students. In a similar vein, the Teacher cell strongly supported the notion of the social nature and function of planning, but for themselves. Here also, they failed to mention students and peer collaboration within the classroom. The teachers rated the survey statement, *planning is a thinking activity,* the lowest priority of all the cells and the survey results (A-91%, B-95%, L-96%, T-84%). This is interesting given that they were, with the Academic cell, the only ones to mention the role of knowledge in their cell definition. It may be inferred from this that, despite their declarative knowledge of planning as a metacognitive activity, in practice, they perceive planning as a primarily procedural, as did the Business cell. The results from the Teacher cell highlight an impressive degree of awareness of planning processes and the uses to which it is put in their roles both professionally and personally. This is evident in the extremely high levels of consensus among the teachers in all areas of the data collection. The high utility of planning is reflected in the fact that the teachers contributed the most descriptors of function. The substance of these descriptors indicate that teachers see planning as an extremely valuable tool for dealing with complexity, stress, time constraints, and personal fulfillment. The omission of reference to the students in their care may support the literature in its supposition that these skills are not reaching the students and that young people may require more modeling and explicit instruction from teachers about their own processes in planning, than is currently the norm.

The greatest differential in survey statement results were from the Business cell, as displayed in Table 1. The strongest difference was for the statement, *making or constructing a plan is part of the process*, rated the lowest score in the results (A-91%, B-47% , L-85%, T-94%), perhaps confirming that the members of the this cell associate less with the formal aspects of plan construction than with the more action-oriented facets of planning. The second greatest discrepancy was for the statement, *the context is important in planning,* (A-93%, B-69%, L-84%, T-90%). It is plausible that planning is so pervasive in the lives of the members of the Business cell, that they perceive planning to apply in all 'in all facets of life' and 'to accomplish most activities on a daily basis' . The Business cell also showed the greatest disagreement in regard to mental representation of all cells. Perceiving planning as a procedural activity, there seems less of an accord about the conceptual basis of planning, than in the other groups. The

membership was clearly divided about the possibility that planning could be unconscious. That many other aspects of planning seem self-evident, is congruent with the Business cell supposition that planning is a 'natural' process. Their concerns support the idea of planning as a relatively stable personality trait, as does Das et. al. (1995). One respondent maintains that "those who can't plan are those who are retrained by methodology/process etc." . Planning may appear to come easily (i.e., naturally) to these individuals, due to a personal predisposition for the type of planning-intensive practices which often constitute successful entrepreneurial activities.

The finding from the present study reveal a striking convergence of the fundamental aspects of the perceptions of the sampled domain-related groups of experts regarding the nature and function of planning. There are areas of dissimilarity across cells, which portray potential domain-related discrepancies. These nuances are both interesting and indicative of individual differences in mental representations of planning.

Implications for Education

Some of the literature of the nineties makes a clear call for the development of these higher-order thinking skills as a way to prepare learners for the complexity of the demands imposed in the future (Tinzmann, Jones, & Pierce, 1990; Jones & Idol, 1990; Adams, 1991; Collins & Mangieri, 1992; Duffy, 1992, Collins Block, 1993). This is predicated upon substantial evidence that effective planning instruction can be augmented by direct, systematic, school-based instruction. The degree of the gains incurred by the learners is related to the conditions of instruction. The implications for cognitive intervention throughout the life-span are significant for both formal and informal instruction. A focus on skills that can be applied during school, work, and everyday problem solving would facilitate the global goal of equipping learners for maximum transfer. It is the contention of the authors that planning has been undervalued as a conduit of instruction in higher order thinking skills. Planning holds promise for the embodiment of many of the metacognitive abilities and processes used by individuals in these varying domains.

There exists a real need for 'planning instructors'. When a cognitive deficit is identified, remediation should be available for learning the components of planning, in a clear and practiced fashion. Instruction and practice have proven to have an impact on the development of metacognitive skills such as planning (Friedman, Scholnick, & Cocking, 1987). The literature proposes various methodologies for enhancing declarative, procedural, and conditional knowledge about planning. As Vygotsky (1978)

advocates, teachers first need to model good planning practices by exhibiting metaplanning and procedural planning skills explicitly for students and by being well-organized and verbal in highlighting these abilities. For example, in their discussion of teaching thinking dispositions, Tishman, Jay, and Perkins (1993) recommend that sensitivity to planful and strategic thinking can be developed by such verbal teacher modeling: "As I was working on such and such a project, I realized my thinking was disorganized, so I made a plan. First, I made a list of my goals ...." (p.148). Teachers must provide tailored challenges for students with appropriate instructional aids to allow the students to function proficiently within their zone of proximal development. Planning aids have been found to make a substantial difference in performance (Chalmers & Lawrence, 1993). Although problem identification and planning operations are foundational skills requiring careful instruction, the practice of planning must be contexualized for students. Planning strategies must of necessity also be adapted to address individual learning styles (Lachman and Burack, 1993). In an ideal situation, teachers provide the scaffolding for students to practice self-regulation through the acquisition of personal planning skills. These teachers model such behavior and provide continual prompts for learners to manifest and explore these emerging abilities.

The present study provides well-explicited data to help students develop their declarative and conditional understanding of both the nature and the function of planning. The definitions of planning, with well-elaborated component terms from four different domains could generate fruitful, in-depth discussion of what is meant by planning and how it is used in the real world. In this fashion, the mental representations of planning held by students can be developed and made more conscious. As the literature suggests, those who plan augment their sense of control over their own operations and over their environmental contingencies. This enhances an interior locus-of-control, which in turn increases motivation, both for decisions to plan and for sustaining effort during planning. Function statement 5 (Planning is used to increase control over the planner's operations or to deal with uncertainty) and FS6 (Planning is used to increase control over situations) provide unambiguous confirmation of the value of planning on an individual's sense of control. At a time when many young people do not have a strong sense of personal control, this focus may have a positive and reverberating effect.

When planning is considered to involve other people, learning must include social mores and expectations for successful interaction, how to incorporate others into one's planning, how to accept feedback gracefully for the benefit of improved plans and their implementation, and the implicit expectations of planning appropriateness in various social contexts (Goodnow, 1987). Function statement

4 (Planning is used to coordinate activities with people) gives numerous examples of the utility of planning in social situations. In their numerous studies of collaborative planning, Rogoff and colleague have examined how guidance for or from others has benefited or changed planning performance. They found that children learn how to plan more effectively when guided by either adults or expert peers than from unskilled peers (Radziszewska & Rogoff, 1991). Gauvain (1992) and Gauvain and Rogoff (1989) were able to show how children benefit by interactively assuming a measure of responsibility for task completion during practice. Rogoff (1991) concludes that appropriate guided participation or apprenticeship in intellectual and everyday problem solving socializes children's planning strategies.

The constraints on the time, resources, and depth of instruction available for learners throughout the life-span vary considerably. The duration of formal education is fraught with instructional demands. There may be significant efficacy in focusing instruction on planning, as it entails a wide range of the metacognitive processes used for the effective problem solving throughout the life-span (goal definition, plan construction, execution, and monitoring, etc.). Pea (1982) suggested a dozen years ago that the "need for instructional programs that guide the development of planning activities is particularly acute, not only for school contexts, but also for everyday problem-solving activities involving career, financial, educational, and family planning" (p.14) and that knowledge of "developmental processes could also be integrated into school curricula and adult education programs that are devoted to promoting planning development" (p.24). It is maintained by the authors that this need is still as important and as urgent in the nineties as it was then.

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Table 1

Comparison of Responses from Survey and Delphi Round One

Response Statement	Scores from Round 1 (%)				Survey
	A[a]	B	L	T	f (%)[b]
Planning is a life skill.	89	91	93	100	70%
Planning is a thinking activity.	91	95	96	84	40%
Planning is a way of preparing for the future.	89	96	85	92	34%
Planning anticipates or responds to opportunities.	96	89	82	84	50%
Planning is an organizational tool.	93	96	93	100	34%
Planning predetermines a course of action.	78	91	89	86	60%
Planning involves interacting with other people	51	75	56	66	44%
Planning is goal-directed.	96	91	93	96	44%
To plan, one must set the goal(s).	80	87	96	80	40%
To plan one selects strategies.	85	91	89	92	63%
Time is a factor in planning.	89	96	87	100	34%
The context is important in planning.	93	69	84	90	57%
One requires motivation to plan.	80	82	82	84	40%
Learning is a part of effective planning.	82	91	80	90	40%
Making or constructing a plan is part of the process.	91	47	85	94	34%

a A, B, L, T stand for Academic, Business, Lay, Teacher cells respectively

b Relative frequency of responses by all respondents (N=30) in survey

Table 2

Definitions of Planning by Each Cell of Delphi Round Three

Cell	Definition of Planning
Academic	Planning is a dynamic, transactional process involving the conscious or deliberate specification of a sequence of actions aimed at dealing with uncertainty for goal attainment. It is dynamic in that strategies used for goal attainment and actions are adapted to environmental contingencies; knowledge gained from completed plans influences the formulation of subsequent plans, goals, mental representations, and actions. Planning encompasses the revisionary processes related to devising ways to attain, elaborate, maintain, monitor, update, and/or abandon goals and schedules, in varying levels of abstraction. Planning, whether short- or long-term, for abstract or specific goals, individual or social, involves the generation, selection, organization, and coordination of strategies for implementing decisions and attaining goals. Planning includes goal management, time management, resource management, action management, and person and relationship management.
Business	Planning is a natural, logical process of identifying and responding to problems, goals, sub-goals, and objectives, which may be short or long term, simple or complex, conscious or unconscious, formal or informal. Planning is the act of choosing among competing possibilities, involving the consideration and selection of priorities, alternatives, strategies, and procedures for goal attainment. Planning is an organizational tool used to develop a program for action, including timing, scheduling, and contingencies in the event circumstances shift; it necessitates assembling all available information which could affect the process. Planning is an iterative process of continual evaluation and revision of goals, visions, plans, and tasks throughout implementation. Planning involves engaging and motivating others, including affected stakeholders at appropriate points. Plans may be: 'routine' plans which involve the coordination of many elements to achieve routine or repetitive tasks, which eventually become almost intuitive in nature; 'strategic' plans which involve innovation and non-routine creation of change, often in the face of competition, opposition, or adversity and; 'contingency' plans in the event routine or strategic plans fail.

Table 2 (continued)

Cell	Definition of Planning
Lay	Planning is a conscious or unconscious decision-making process, whereby an individual or group of individuals systematically organize a sequence of steps toward the achievement of a desired goal or objective. Depending on the circumstances, the process, steps, and goals may vary in complexity, scope, duration (short /long term), be individual or social, formal or informal. Planning involves analysis, choice, and coordination of goals, priorities, options, and courses of action with regard to human and material resources and other factors, including time. Goals and plans are continually evaluated and adjusted to account for or respond to feedback and unforeseen events. Often a personal, sometimes a consultative, collaborative process, planning is an essential element of control over personal and professional objectives at all levels.
Teacher	Planning is a metacognitive, decision-making process involving conceptualizing, choosing, priorizing, and organizing goals, strategies and procedures needed to meet the objectives Goals or plans may be short-term or long-term, simple or complex, flexible or rigid, formal or informal, individual or social. Consideration is given to the uses, influences, and constraints of human and material resources, including time. Planning may also involve intuition and the unconscious. In a process of ongoing plan implementation, monitoring, evaluation, and revision, the planner may use feedback to adjust or refine goals, expectations, and strategies. Planning involves ordering one's life according to personal goals, living standards, and responsibilities. Often a consultative, collaborative process, planning utilizes past experience, existing knowledge and even new knowledge.

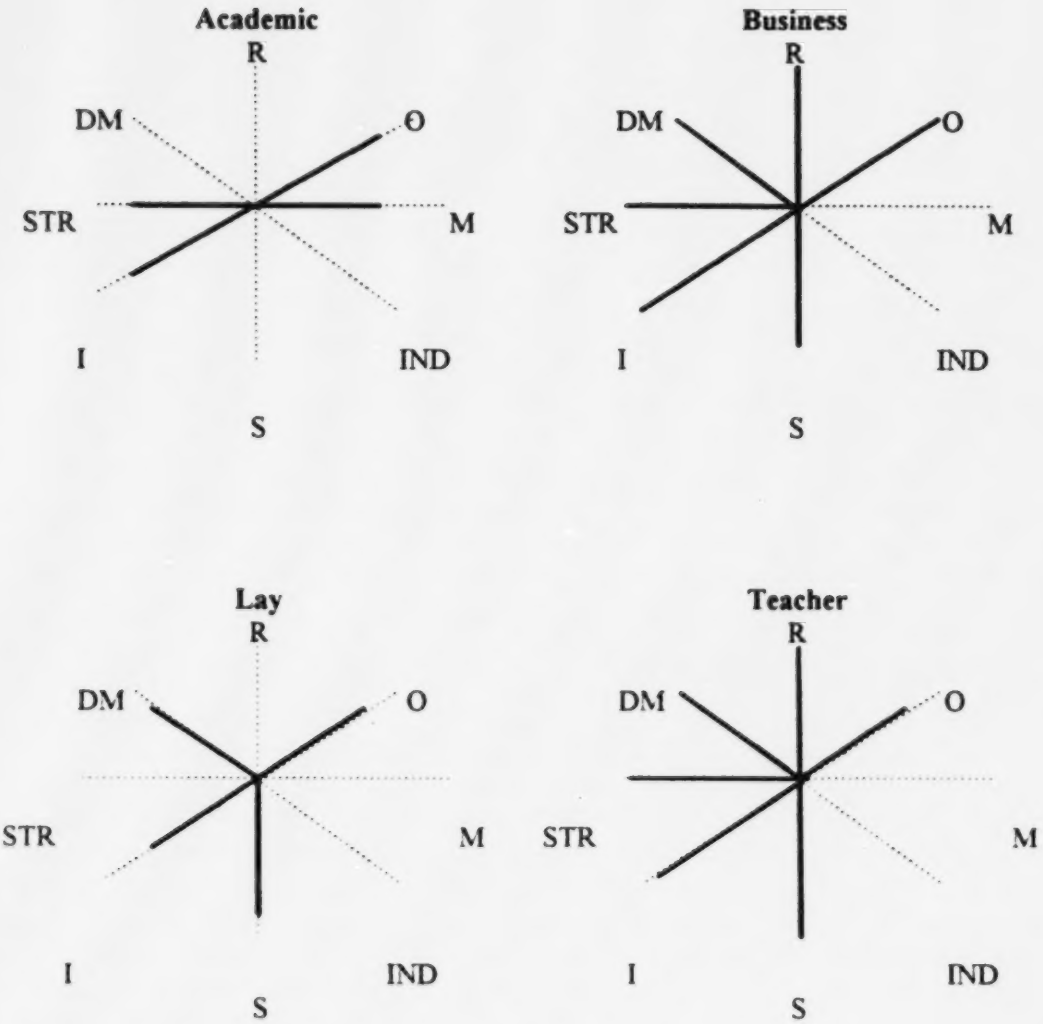

Figure 1 Signatures of Definitions

Note: R stands for the Representation Dimension
O stands for the Organization Dimension
DM stands for the Decision Making Dimension
M stands for the Management Dimension
STR stands for the Strategy Dimension
I stands for the Regulation Dimension
IND stands for the Individual Dimension
S stands for the Social Dimension

Table 3

Definition of Component Terms of Planning

Component	Definition	A	B	L	T
Goal	the end toward which effort is directed	F	F	F	F
Mental Representation	a psychological organization of components relating to a given set of phenomena in environments, in the mind of the planner	F			
	a psychological organization of components relating to a given environment		F	F	F
Decision Making	a determination arrived at after consideration	F	F	F	F
Organization	an arrangement or form of coherent unity or functioning whole	F			
	something arranged in a pattern or structure		F	F	F
Regulation	the act of monitoring, controlling, or guiding a process	F	F	F	F
Social	the interaction of an individual with other people		F	F	F
Plan	a blueprint for action	F	F	F	F

Note: F indicates full agreement or consensus from the entire cell

Table 4

Final Results of Delphi Responses on the Function of Planning

Code	Function Statement	A	B	L	T
	Planning is used:				
FS1	to enhance problem solving or goal -directed activity	F[a]	F	F	F
FS2	to organize material resources	F			
	to organize human and material resources		F	F	F
FS3	to structure the future	F			
	to think about the future		F	F	
	to prepare for the future				F
FS4	to coordinate activities with people	F	F	F	F
FS5	to increase control (real or perceived) over the planner's operations	F			
	to deal with uncertainty			F	9/10[b]
	achieve greater comfort with uncertainty		7/11		
FS6	to increase (real or perceived *) environmental control	F			
	to increase control over situations		F	F	F
FS7	to substitute for action	7/8			
FS8	to respond to most everyday situations	F		F	
	to respond to most everyday problem solving situations		F		F
FS9	to enhance one's life		F	F	F
FS10	for evaluation		F		

* indicates additional comment from the final round, which makes a contribution to the clarification or elaboration of the original meaning of the cell, although it was unavailable for group consensus

a F refers to full agreement by the members of the entire cell

b The first number refers to the total respondents agreeing to the statement, the second number refers to the total number of respondents in the cell in question.

Table 5

Composite Definition of Planning

Planning is a metacognitive, decision-making process involving conceptualizing, choosing, priorizing, and organizing goals, strategies, and procedures for goal attainment. Depending on the circumstances, goals or plans may be short-term or long-term, simple or complex, flexible or rigid, formal or informal, individual or social. Planning involves analysis, choice, and coordination of goals, priorities, options, and courses of action with regard to human and material resources and other factors, including time. Planning may also involve intuition and the unconscious. Planning encompasses ongoing revisionary processes related to devising ways to attain, elaborate, maintain, monitor, update, and/or abandon goals and schedules, in varying levels of abstraction. It is dynamic in that strategies used for goal attainment and actions are adapted to environmental contingencies; knowledge gained from completed plans influences the formulation of subsequent plans, goals, mental representations, and actions. Plans may be: 'routine' plans which involve the coordination of many elements to achieve routine or repetitive tasks, which eventually become almost intuitive in nature; 'strategic' plans which involve innovation and non-routine creation of change, often in the face of competition, opposition, or adversity and; 'contingency' plans in the event routine or strategic plans fail. Planning includes goal management, time management, resource management, action management, and person and relationship management. Often a personal, sometimes a consultative, collaborative process, planning is an essential element of control over personal and professional objectives at all levels.